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We certify that Yasuyuki Tateishi is a professional translator, associated with Corps Diplomatique Associates, that he is thoroughly familiar with the English and Japanese languages, that he translated the attached documents: **PATENT APPLICATION # 594006703, RE: MAEDA OKUGAI BIJUTSU KABUSHIKI KAISHA., CO., LTD.**, from Japanese into the English language, and that the English translation is a true and correct version of the Japanese original to the best of our knowledge and belief.



Bogdan Lenkiewicz

Sworn before me on
this 26 day of January 2009.



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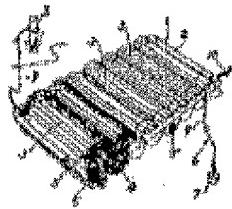
(54) [Title of the Invention] A Raft Type Plant Growing Floating Bed

[57] [Abstract]

[Object] To attempt to grow plants on the water surface in a lake, a pond, or a river, and to secure a living space for wild birds, fish, insects living in water, etc., as well as to promote reproduction or multiplication of microorganisms having a water quality improving effects and useful for water purification and thereby to attempt improvements of natural environments.

[Constitution] The raft type plant growing floating bed in accordance with the present invention constitutes a floating structure 1 having sufficient buoyancy on a water surface by combining and constituting

hollow pipes made of a synthetic resin in a lattice -frame form. A linear porous synthetic resin material made as a unitary body by heating, melting and extruding a thermoplastic synthetic resin from a nozzle thereby forming a linear body of an appropriate thickness, by curling and stacking or layering it, by fusing and forming the linear contact points mutually in such a manner that it may have a pre- determined thickness and linear density is allowed to entwine around lattice frames of the floating structure 1, thereby forming an enrooting layered body 4 as a unitary body. It is characterized to have a structure on which plants are allowed to grow in water on the enrooting layered body 4 which is allowed to float on a water surface.



[What we claim is]

[Claim 1] A raft type plant growing floating bed comprising a floating structure having sufficient buoyancy on a water surface by

combining and constituting hollow pipes made of a synthetic resin in a lattice -frame form, thereby closing tightly inner pipe pores, and an enrooting layered body formed as a unitary body obtained by entangling on lattice frames of the above - mentioned floating structure a linear porous synthetic resin material formed as a unitary body by heating, melting and extruding a thermoplastic synthetic resin from a nozzle thereby forming a linear body of an appropriate thickness, by curling and stacking or layering it, by fusing and forming the linear contact points mutually in such a manner that it may have a pre-determined thickness and linear density, said raft type plant growing floating bed characterized to have a structure on which plants are allowed to grow in water on the enrooting body which is allowed to float on a water surface.

[Claim 2] A raft type plant growing floating bed comprising a floating structure having sufficient buoyancy on a water surface by combining and constituting hollow pipes made of a synthetic resin in a lattice -frame form, thereby closing tightly inner pipe pores,

an enrooting layered body formed as a unitary body obtained by entangling on lattice frames of the above - mentioned floating structure a linear porous synthetic resin material formed as a unitary body by heating, melting and extruding a thermoplastic synthetic resin from a nozzle thereby forming a linear body of an appropriate thickness, by curling and stacking or layering it, by fusing and forming the linear contact points mutually in such a manner that it may have a pre-determined thickness and linear density

and plant seed /seedling support members made of a natural bog moss or a synthetic resin fiber entwining body, etc., being packed and supported in the gaps of the enrooting layered body constituted with the above - mentioned linear porous synthetic resin material,

said raft type plant growing floating bed characterized to have a structure on which plants are allowed to grow in water on the enrooting body which is allowed to float on a water surface.

[Claim 3] A raft type plant growing floating bed, in accordance with Claim 1 or Claim 2, in which the lattice of the above - mentioned

floating structure constitutes ladder like lattice frames.

[Claim 4] A raft type plant growing floating bed, in accordance with Claim 1 or Claim 2, in which the lattice of the above - mentioned floating structure constitutes checker board like lattice frames.

[Claim 5] A raft type plant growing floating bed, in accordance with Claim 1 or Claim 2, characterized by having an anchor structure, one side of which is anchored to the above - mentioned floating structure and another side of which is anchored to the bottom of the water or a shorefront.

[Claim 6] A raft type plant growing floating bed, in accordance with Claim 1 or Claim 2, characterized by being equipped with a connecting cord by which to connect an adjacent raft type plant growing floating bed to the above - mentioned floating structure.

[Claim 7] A raft type plant growing floating bed, in accordance with Claim 1 or Claim 2, characterized in that the plan configuration of the above - mentioned raft type plant growing floating bed is constituted in a basic configuration which allows parallel lengthwise and crosswise

floating installation thereof, such as a square, rectangular, hexagonal or triangular shape, etc.

[Detailed Explanation of the Invention]

[0001]

[Technology Area to which the Invention Belongs] The present invention relates to a raft type plant growing floating bed by which to attempt to allow plants to grow on the water surface of a man made lake such as dam lake, a natural lake or pond, or a normal plane of a lakefront formed due to a change in water level or bank protection, to promote the multiplication of microorganisms useful for water purification and to secure a living space of water insects or animals.

[0002]

[Conventional Technology] In recent years, various problems have been mentioned about water resources of a dam lake and scenery of rivers and dam lakes themselves. That is, there have been problems in that since plants grown along the normal plane of a lakefront at the time when it is full, die down when covered with water, brown soil appears, and

becomes unsightly at the draught period, and that at the rainy season, said normal plane becomes eroded, and sand soil accumulate on the fixation (sic: Note of translator: probably a misprint of "lake bottom").

[0003] In addition, at a draught period, there have been problems in that the environments at the water front where microorganisms live change in addition to the exposure of soil, thereby reducing the water quality purifying capability, and blue green algae grows.

[0004] These problems take place similarly in rivers, and there have been various attempts made to recover the environments of shorefronts lost due to bank protection works, and there have been hoped for effective methods by which to create sceneries where water plants grow, to promote multiplications of microorganisms which are effective for water purification and to secure the living space for water insects and animals.

[0005]

[Problem Points which the Invention Tries to Solve]

Therefore, in view of the above - mentioned requests and desires, the

Applicant of the present invention has been continuously carrying research of low cost and highly efficient methods by which to solve these problems, and the present invention has been achieved as part of such research. That is to say, the purposes of the present invention are to attempt to grow plants on the water surface or the normal plane of a lake front, etc. caused by bank protection or a change in a water level in an artificial water reserve such as a dam lake and a natural lake, pond, or river, and to secure a living space for wild birds, fish, insects living in water, etc., as well as to promote reproduction or multiplication of microorganisms having a water quality improving effects and useful for water purification and thereby to attempt improvements of natural environments.

[0006]

[Means by which to Solve the Problem Points]

A raft type plant growing floating bed, in accordance with the present invention, comprising
a floating structure having sufficient buoyancy on a water surface by

combining and constituting hollow pipes made of a synthetic resin in a lattice -frame form, thereby closing tightly inner pipe pores, and an enrooting layered body formed as a unitary body obtained by entangling on lattice frames of the above - mentioned floating structure a linear porous synthetic resin material formed as a unitary body by heating, melting and extruding a thermoplastic synthetic resin from a nozzle thereby forming a linear body of an appropriate thickness, by curling and stacking or layering it, by fusing and forming the linear contact points mutually in such a manner that it may have a pre-determined thickness and linear density, and the raft type plant growing floating bed can be summarized in that it has a structure on which plants are allowed to grow in water on the enrooting body which is allowed to float on a water surface.

[0007] A raft type plant growing floating bed, in accordance with the present invention, comprising a floating structure having sufficient buoyancy on a water surface by combining and constituting hollow pipes made of a synthetic resin in a

lattice -frame form, thereby closing tightly inner pipe pores,
an enrooting layered body formed as a unitary body obtained by
entangling on lattice frames of the above - mentioned floating structure
a linear porous synthetic resin material formed as a unitary body by
heating, melting and extruding a thermoplastic synthetic resin from a
nozzle thereby forming a linear body of an appropriate thickness, by
curling and stacking or layering it, by fusing and forming the linear
contact points mutually in such a manner that it may have a pre-
determined thickness and linear density
and plant seed /seedling support members made of a natural bog moss or
a synthetic resin fiber entwining body, etc., being packed and supported
in the gaps of the enrooting layered body constituted with the above -
mentioned linear porous synthetic resin material,
said raft type plant growing floating bed can be summarized in that it has
a structure on which plants are allowed to grow in water on the enrooting
body which is allowed to float on a water surface.

[0008] These raft type plant growing floating beds can be reduced to

practice by constituting ladder like lattice frames of the above - mentioned floating structure constitutes or checker board like lattice frames of the above - mentioned floating structure. In addition, it becomes possible to expand in the plane direction and install in a floating manner a large number of raft type plant growing floating beds by providing an anchor structure, one side of which is anchored to the above - mentioned floating structure and another side of which is anchored to the bottom of the water or a shorefront, thereby securing the anchorage of the raft type plant growing floating beds at pre- determined positions, and by providing connecting cords by which to connect adjacent raft type plant growing floating beds to the above - mentioned floating structure.

[0009] By allowing the plan configuration of the above - mentioned raft type plant growing floating bed to be of a basic configuration which allows parallel lengthwise and crosswise floating installation thereof such as a square, rectangular, hexagonal or triangular shape, etc, it is characterized in that the view when they are expanded and installed in a

floating manner on a water surface can be made more stable.

[0010]

[Mode of the Working of the Invention]

In the following, we shall explain the desirable modes of working of the present invention with respect to the raft type plant growing floating bed in accordance with the present invention. In the drawing, Symbol 1 denotes a floating structure for which the inside of the peripheral frame 2 made, in a rectangular form, of a hollow pipe of a synthetic resin such as a vinyl chloride resin is constituted with lattice frames 3, 3... made of longitudinal lattices of a ladder form.

[0011] The peripheral frame 2 and the lattice frames 3, 3... are tightly closed to secure the inner pores of the hollow pipes, and the total volume of the inner pores in the pipes are adjusted to maintain sufficient buoyancy on a water surface. In addition, the above - mentioned peripheral frame 2 is allowed to assume a basic form of a plane configuration having the ratio of the longitudinal and transversal lengths of 1 : 2.

[0012] Symbol 4 denotes an enrooting layered body made of a linear porous synthetic resin made as a unitary body by heating, melting and extruding a thermoplastic synthetic resin from a nozzle thereby forming a linear body of an appropriate thickness, by curling and stacking or layering it, by fusing and forming the linear contact points mutually in such a manner that it may have a pre-determined thickness and linear density, and said enrooting layered body is folded in a wave form in the lateral side configuration and is allowed to entwine around the peripheral frame 2 and lattice frames 3, 3... of the floating structure 1 as a unitary body.

[0013] Symbol 5 denotes plant seed /seedling support members made of a natural bog moss or a synthetic resin fiber entwining body, etc., being packed and supported in the gaps of the enrooting layered body constituted with the above - mentioned linear porous synthetic resin material, and it is constituted in a higher density than the linear density of the enrooting layered body 4, and seeds a of a plant or seedlings are maintained in the linear gaps of the enrooting layered body 4 at such a

density to prevent seeds a of a plant or seedlings from coming off.

[0014] Symbol 6 denotes an anchor structure consisting of a tether cord 9 , one end of which is tied to the peripheral frame 2 of the above - mentioned floating structure and the other end of which is tied to an anchor 7 sunk at the water bottom or a pile 8 driven in a shorefront, and Symbol 10 denotes a connecting cord by which to tie the floating structure 1 and an adjacent raft type plant growing floating bed.

[0015] The raft type plant growing floating beds of the above - mentioned structure can be used singly or in a plurality which are connected by connecting cords 10 by floating them on a water surface and anchoring them to the bottom of water or a shorefront of a lake, etc. by use of an anchoring structure 6. At this time, it is possible to connect the group of the raft type plant growing floating beds in such a manner that the raft type plant growing floating beds at the edges may be continuous from the normal plane of a lake or a pond.

[0016] Here in the above - mentioned mode of working, we have explained the one having a structure of a unitary body in which plant

seed /seedling support members 5 made of a natural bog moss or a synthetic resin fiber entwining body, etc., being packed and supported in the gaps of the enrooting layered body 4 constituted with the above - mentioned linear porous synthetic resin material. However, as to the above - mentioned plant seeds or seedlings support members 5, in a case in which it is considered that said plant seeds or seedlings can be sufficiently supported in the linear gaps of the linear porous synthetic resin material of the enrooting layered body 4, it is possible to eliminate the plant seeds and seedlings support members 5 and to plant plants directly in the enrooting layered body 4.

[0017]

[Example embodying the invention] With the present invention, a greening installation on a water surface having an appropriate area is constructed on a water surface by connecting raft type plant growing beds with connecting cords 10, and as the plane configuration of the peripheral frame 2 of the floating structure is shown in Fig. 5, said raft type plant growing floating bed is constituted in a basic configuration of

(a) square, (b) rectangle, (c) hexagon, or (d) triangle, etc. which allows them to be float and installed in a parallel lengthwise and crosswise form.

[0018] In addition, as shown in Fig. 6, the lattice constitution of the floating structure 1 can be not only of (a) the ladder like form as mentioned above but also of (b) checker like lattice frame 3 a. Here even if this checker like lattice frame 3 a is adopted, it is tightly closed to secure the inner pores of the hollow pipe, and the total volume of the inner pores of the pipe is adjusted to provide sufficient buoyancy on a water surface.

[0019]

[Effects of the Invention] As mentioned above, since with the raft type plant growing floating bed in accordance with the present invention, the floating structure of the floating bed is constituted with a hollow pipe or pipes, it is possible to adjust the buoyancy just by changing the diameter of such a hollow pipe, and since the structure is an extremely simple one obtained by folding an enrooting layered body made of a linear porous

synthetic resin in such a manner that the side configuration may assume a wave form and by entangling it around the peripheral frame and lattice frames of the floating structure, as a unitary body, it is characterized in that it is strong in structure and can be provided at a low cost, etc.

[0020] The above - mentioned raft type plant growing floating bed allows plants to grow and flourish on the enrooting layered body made as a unitary body with the float structure, thereby allowing sceneries of luxuriant plants to be created on a water surface. Therefore if it is installed in a dam lake or a river, it becomes possible to maintain a lake (sic: misspelling Note by translator: a lake should be eliminate) stably a green scenery independently of a change in water level.

[0021] In addition, with the above - mentioned raft type plant growing floating bed, since the absorption of nutrient salts in water is promoted by luxuriant plants, the problem of a highly nutrient condition of a water quality is solved, thereby improving the water quality, and furthermore, the roots of the luxuriant plants on said raft type plant growing floating bed drift in water, and it becomes easier for microorganisms to grow and

multiply. Therefore, it provides excellent features in that the improvements in water quality due to the microorganisms are further accelerated, living spaces for fish, shell fish and water insects which gather to eat these microorganisms can be secured, and thus water quality improving effects and improvements in natural environments can be achieved. That is, the effects of the present invention are extremely great after reducing it to practice.

[Simple Explanation of the Drawings]

[Fig. 1] is an obliquely seen view of the raft type plant growing floating bed in accordance with the present invention, when it is partially notched.

[Fig. 2] is an expanded cross sectional view of the major section thereof.

[Fig. 3] is an explanatory drawing by which to show the state in which it is installed on a water surface in a floating manner.

[Fig. 4] is an approximate plan view which shows the state in which a plurality of raft type plant growing floating beds are connected and installed in a floating manner.

[Fig. 5] is an approximate plan view of raft type plant growing floating beds having different plane configurations.

[Fig. 6] shows examples in which lattices of lattice frames of the floating structure are combined. (a) approximate plane view of a ladder form and (b) approximate plane view of a checker like form.

[Explanation of the symbols]

1 is a floating structure,

2 is a peripheral frame,

3 is a lattice frame,

4 is an enrooting layered body made of a linear porous synthetic resin material,

5 is a plant seeds or seedlings support member,

6 is an anchor structure,

7 is an anchor,

8 is a pile,

9 is a tether cord and

10 is a connecting cord.

Fig. 1

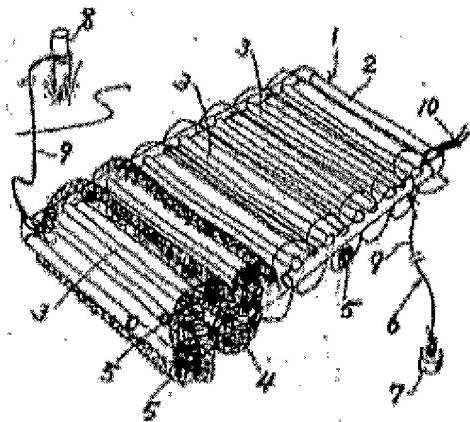


Fig. 2

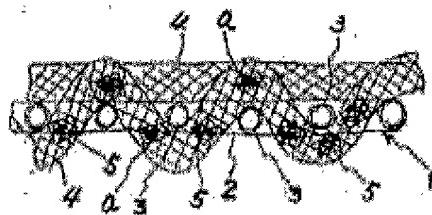


Fig. 3

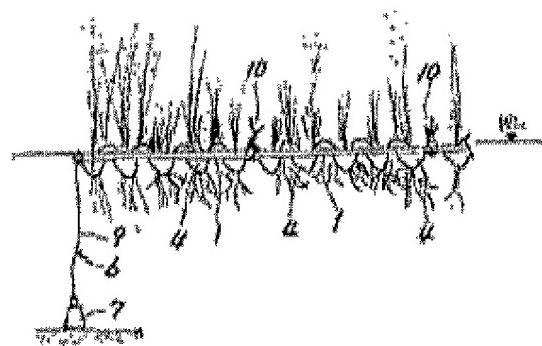


Fig. 4

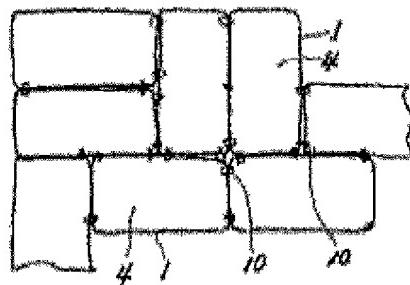


Fig. 5

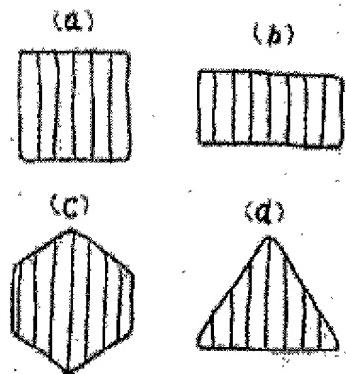


Fig. 6

